

SEQUENCE LISTING

<110> AZPIROZ, Ricardo
CHOE, Sunghwa
FELDMANN, Kenneth

<120> DWF4 POLYNUCLEOTIDES, POLYPEPTIDES AND USES THEREOF

<130> 2225-0001

<140>

<141>

<150> 60/119,657

<151> 1999-02-11

<150> 60/119,658

<151> 1999-02-11

<160> 18

<170> PatentIn Ver. 2.0

<210> 1

<211> 6888

<212> DNA

<213> Arabidopsis sp.

<400> 1

atgtggggtat	tatattgttg	ggttcgggtt	gagctacaat	ataaatttcg	tgtttctggg	60
tattctgttc	acatgatttg	agtttggttc	tcaatttggg	ttccaagata	attaaatatt	120
aaaatttcatt	taaaatattt	acaagtaatt	aattatcttt	acattgtatt	gttataacaa	180
aatatctatc	tttggatat	gagaaaatat	ggagtttggg	atttataata	ataaaggaaa	240
taatcgattc	catttggttg	gattacacag	ttaagttttt	gtgtttcttt	tggtatatgt	300
atatgagtaa	atcaaaaaga	gtattgattg	aagtgtaaac	atatttcggt	atgaccccca	360
aaaaaaaaaa	aaaaacaaac	aaacaaaccc	cccccccgat	atagtttttg	gttctggatt	420
aggtttattt	gatcataatt	acatgcatca	tttctttgat	tactatgaag	attttcttac	480
caattaaaat	ttcgaattca	tatctcttga	ttattaaatt	aaatacgagt	gtgaatatcc	540
gtttatcgat	cactccaatc	atgattatga	ttcttggtgt	aatccagcaa	attattaaca	600
agagtattga	gaaaaaacgg	aaaataagaa	aagggaaaaga	gtagtgacc	atggagtatg	660
tgaataatta	tcaaagagaa	taagagatga	caaccaaag	gttgtggaat	aatggtcctt	720
gccagctttc	tctcacaatc	aatatcgacc	ctatttggat	tttctggata	ttcgttaaaa	780
tttgcgataa	cgattgtgaa	aaatatttta	tttgtttagct	gatctcaata	ttatgttcca	840
ggtattttgca	taatcttctg	tttaaagcat	attttgtctt	tctttttgtt	tcgtttctct	900
taactatata	ttatcgcgga	tatattgataa	caatgatata	tcacaaaaca	attgtctggg	960
accattttga	ataaactttt	tctcaaacat	tacgggacac	tggaactcgac	ccttaaaata	1020
cgatttttaca	gcgtcactag	ttgagattac	tagcataaag	cataaaggac	ccgttcaagc	1080
tatttataca	aagttacaaa	ctgaatatag	cttgaaatcc	tttagaaaaat	tttggaatta	1140
ccggttggtta	tgtaaatata	gatttagtgg	taaacaaata	tgtaaatcaa	ttagtgtgtca	1200
acatacatat	aattccttac	agaaaaaaca	aacttaagag	aagttaacat	atccatatat	1260
gggtatgcta	tacctttcac	gtatgctata	ctagagacta	aagaatagtt	atgtgatgtc	1320
gataaatgaa	attcacacgc	gtggtaataa	ttatgggacc	gtatgttacg	atcactgcaa	1380
atatcattct	tggttggtca	acaataaaaa	caaaaacaag	aaaaaaagaa	aacgattttt	1440
cttggaattcc	attcaatgat	ctaaaatgca	tagatctttt	gggttacagt	ttcgaagtcc	1500

tctacaagcg	tgtaaccatc	tgcaactatt	aaattgcttt	ctttaatgca	tctttaacat	1560
atattattgtt	agttggaatt	taataagagc	gaacttgtaa	cattacaata	tttatattag	1620
atactagtat	gtgattattc	caaatacata	ctttggatgt	ttaaacttaa	tcttgtttct	1680
tcctacggta	taaataattaa	tcacgcgaggt	aaaaaaagtt	ttgtcttatt	ttcgcgatgc	1740
atgaaggata	aacctaataga	ctttaatttt	ttgaaaatgt	aaccctttta	ctcatagatt	1800
aattaccgta	tgtttttgtt	gccataatga	cagcctctac	aactgtgata	gtcaattttt	1860
tctgcaaata	ttaaattagg	aattcaatgc	tactatcaat	agaagaaaca	gctgagtatt	1920
acattttaat	ttaaagacaa	aattttttgaa	aaatgttata	atctctaaca	atattattaa	1980
aatatgatgc	ctataatgta	tttcctatgt	tcttaaaaata	ttttttttta	tatttagtta	2040
taaatacatt	atgaaccaat	aatagttggg	gaattcaaat	atctccatta	atattttttg	2100
aaatctacaa	attattaata	tttagtcaat	aacaatgcat	agaaagtcc	aaaaaaaaat	2160
ttgttaacag	aaacttccaa	attttttttt	tttatggaac	aagaaataac	agatagaaaa	2220
ctattttgtt	tggaatgga	agtagtaata	tacattaagc	aaattttaaa	aaattatata	2280
agcctatacg	cgctcaaagt	atgttatcta	gtaggtgtaa	ttaataatgc	atgggtgcgat	2340
tcagaattgg	gacaacaatg	aaaacggaat	taaaatatta	actttaaaat	aaataaaaaat	2400
ttgagtaaat	gtgttttctg	actattgagg	ggcaaaaaaa	agacaatgcc	aaaagtctac	2460
gggtttgact	gtccagttcg	gtaataatct	aataactctg	tctttgaccg	cacgctcgtg	2520
taggggtcct	tctgacattt	tactgttct	accctactc	gtgagccac	ccttttccca	2580
tatcctaagg	gtaatttttg	aaatcccaat	ttaaaccgat	tgagaccgta	ccggacttcc	2640
tgggattctg	ctggagcatt	tatcaaaaat	tattagcacg	aatgggttta	ttaatttaaa	2700
aactcacaac	ttgatcagat	aaaatttcat	aaacactttt	acgatggatt	cgtacgatct	2760
atctaatagac	tttttttttt	ctaccacggg	ggatgaaagt	tatagtacta	ttagccagag	2820
acaattgatt	atagatatat	ccattaatcc	atgatattta	tgatataaat	agctgttaaa	2880
ctatttccagc	atcgcagctt	tctgcaactt	ttgtttttta	tttaagagtt	taataaataa	2940
aagtattaaa	aggagcataa	cgaggcaaca	aaagtaatga	acacggagaa	acaaaagcca	3000
tgaagctcat	tggttagttt	aagcttaata	agaagatttt	attaaatttt	aatgacgatg	3060
ataacaatta	tattttctga	cttcttttaa	acccctctt	acaaacagaa	gctccctttt	3120
tcagtagaag	tccgattccc	aatcttaaaag	acaaagccat	tagaaagaga	aagtgagtga	3180
gagagagaga	gaaactagct	ccatgttcga	aacagagcat	catactctct	tacctcttct	3240
tctttcccca	ctcgttttgt	ctcttcttga	ctcttggatt	ctcttgaaaga	gaagaaaatg	3300
aaaaaccaga	ttcaatctac	ctccgggtta	atccggttgg	ccatttcttg	gtgaaaccat	3360
cggttatctt	aaaccgtaca	ccgccacaac	actcggtgac	ttcatgcaac	aacatgtctc	3420
caagtaaaaa	acaacatctt	ccaaaaactc	aaaaaaataa	atcctctgtt	tttgaaattt	3480
gactaatgtt	gtttattttta	caggtagtgt	aagatatata	gatcgaactt	gtttggagaa	3540
ccaacgatcg	tatcagctga	tgctggactt	aatagattca	tattacaaaa	cgaaggaagg	3600
ctctttgaat	gtagttatcc	tagaagtata	gggtgggattc	ttgggaaatg	gtcgatgctt	3660
gttcttgttg	gtgacatgca	tagagatatg	agaagtatct	cgcttaactt	cttaagtcac	3720
gcacgtctta	gaactattct	acttaaagat	gttgagagac	atactttgtt	tgttcttgat	3780
tcttggcaac	aaaactctat	tttctctgct	caagacgagg	ccaaaaaggt	ttttattttt	3840
atcttttatt	ttgctaaatt	tttttgttta	tgaatcttta	gagtttctaa	cttttttttt	3900
tttaattgaa	cagtttacgt	ttaatctaata	ggcgaagcat	ataatgagta	tggatcctgg	3960
agaagaagaa	acagagcaat	taaagaaaga	gtatgtaact	ttcatgaaag	gagttgtctc	4020
tgctcctcta	aatctaccag	gaactgctta	tcataaagct	cttcagggtac	atttattttt	4080
ttttgctgta	aagtcacaaa	ctctcattat	aggtttttta	ttttattttta	tgtgttaaat	4140
aaaatatcta	aaatggttgt	gtagtacga	gcaacgatat	tgaagttcat	tgagaggaaa	4200
atggaagaga	gaaaattgga	tatcaaggaa	gaagatcaag	aagaagaaga	agtgaaaaca	4260
gaggatgaag	cagagatgag	taagagtgat	catgttagga	aacaaagaac	agacgatgat	4320
cttttgggat	gggtttttgaa	acattcgaat	ttatcgacgg	agcaaattct	cgatctcatt	4380
cttagtttgt	tatttgcgg	acatgagact	ctctctgtag	ccattgctct	cgctatcttc	4440
ttcttgcaag	cttgccctaa	agccgttgaa	gagcttaggg	taagataaatt	ataacagcac	4500
aagttaatta	ctaccaaatt	gttacgtatt	atataagtta	ttatagaatt	attctattag	4560
aatatacgat	gaaaaaagta	tgtatatatta	attgtcacta	attttatgtt	tattgattta	4620
tacttttgaa	ggaagagcat	cttgagatcg	cgagggccaa	gaaggaaacta	ggagagtcag	4680
aattaaattg	ggatgattac	aagaaaatgg	actttactca	atgtgtatgt	tactatcatt	4740

```

ctcattatatt attctatggt catatgattt atgatgaaac caaaattatt gatttttttt 4800
ttgggtgtgtg tgaagggttat aaatgaaact cttcgattgg gaaatgtagt taggtttttg 4860
catcgcaaag cactcaaaga tggttcggtac aaaggtaaaa ctttacgtac aaaattttta 4920
aataatgaaa tccggaatat tgaaatctta ttggatgaaa aatattaaaa taattttacat 4980
ttcttaatgt tggaaaaaag gatacgatat ccctagtggg tggaaagtgt taccggtgat 5040
ctcagccgta catttggtata attctcggtta tgaccaacct aatctcttta atccttggag 5100
atggcaacag gtaataaaaa agtttctctc gttaactatc gaaaattagt gtatagtttt 5160
ttcatctatt gcatgaatag atacgtccta cgtgatttac ctatctatag atactatacg 5220
agaactatta atctggcaaa aactttttat tattattatc tttcaagtta gatcttaaca 5280
cgtcatggat cattgatcac atgaaagcat ataaattaaa aataagagag agaaagagac 5340
gtgttggtgt aagtgtacgt gaagacaatt aattagttag atgggtatgtc ttaaatgacg 5400
taggagctgc ctaaattatt ttataatcgt gaccgttgat ttattattag tcacggcctt 5460
gatacaattt aagatttgac ggacgatggg accacggcct tgacggatct cacacgcccg 5520
atgacttgta cgtgcgttag attctgccac gttgactggg ttttaactct agatttataa 5580
ctctattaat tataacaact atcaaatcgg cgaattagag aaatatacta tatagtatta 5640
ttatgattat tatgagataa tactttatga aataagataa taatggtagt catgatgtta 5700
tagtgagtgg ggaaggtaag aggtggtgag agatgattaa tgacccacg tgggtgtggtg 5760
ccaacaagca cgtgttcttc ttcttttttt cttcccaact tctttttttg ggggtttatt 5820
gtgatttata aaatcgggtt gtcgtttttt tttgtgacga gcagcaaaac aacggagcgt 5880
catcgtcagg aagtggtagt ttttcgacgt ggggaaacaa ctacatgccg tttggaggag 5940
ggccaaggct atgtgctggt tcagagctag ccaagttaga aatggcagtg tttattcatc 6000
atctagttct taaattcaat tgggaattag cagaagatga tcaaccattt gcttttcctt 6060
ttgttgattt tcctaacggt ttgcctatta gggtttctcg tattctgtaa aaaaaaaaaa 6120
agatgaaagt atttttatct tcttcttttt tttttgataa ttttaaatca ttttttttgc 6180
ccaatgatat ataaaaatct ggataaataa tattattgga tattcgtttt ttagttcggg 6240
tttgagaaaa gggtttcgac ttctgaaagt ggacgatgta tatagattgg gagctagggt 6300
gagtccttgg acatttgtat tggatgttgt tgattattag tgtcgacact attaaacctt 6360
aaatgggctt tctataaggc ccaattatat tacgattata acaaagtgc aacttttact 6420
tcgtttttga tccgaagcaa taacaaattg tcaaatacca aacacaagaa ttatgtaaac 6480
actcgtgtgt gtctagtggg aaatcattgg gctggagact gaacatcaga acacaagaaa 6540
cctgtcaatt atggatacac ctcctatgac ggtttccaaa ctttatcttg attcttatcg 6600
tgttacattg acacaaagag ttaggtgtca aaaggactaa atgaataaca atagctctca 6660
ggataagaag gttcataaaa tggtttcttt attttgagaa gaaagagaga ggagctttta 6720
ctgtttcttg ggtcctatct ctttaaatga gagggtttcg tttttacttc ttctatctca 6780
tcacttttag gatcctcttc tagacgagta aagtaatcct cgttaccaag caatgggtctc 6840
atcttttgaa gacaggtctt ttccaagtcc tagttcaggg caaagctt 6888

```

<210> 2

<211> 513

<212> PRT

<213> Arabidopsis sp.

<400> 2

```

Met Phe Glu Thr Glu His His Thr Leu Leu Pro Leu Leu Leu Leu Pro
  1                      5                      10                     15

```

```

Ser Leu Leu Ser Leu Leu Leu Phe Leu Ile Leu Leu Lys Arg Arg Asn
      20                      25                      30

```

```

Arg Lys Thr Arg Phe Asn Leu Pro Pro Gly Lys Ser Gly Trp Pro Phe
      35                      40                      45

```

```

Leu Gly Glu Thr Ile Gly Tyr Leu Lys Pro Tyr Thr Ala Thr Thr Leu
      50                      55                      60

```

Gly Asp Phe Met Gln Gln His Val Ser Lys Tyr Gly Lys Ile Tyr Arg
65 70 75 80

Ser Asn Leu Phe Gly Glu Pro Thr Ile Val Ser Ala Asp Ala Gly Leu
85 90 95

Asn Arg Phe Ile Leu Gln Asn Glu Gly Arg Leu Phe Glu Cys Ser Tyr
100 105 110

Pro Arg Ser Ile Gly Gly Ile Leu Gly Lys Trp Ser Met Leu Val Leu
115 120 125

Val Gly Asp Met His Arg Asp Met Arg Ser Ile Ser Leu Asn Phe Leu
130 135 140

Ser His Ala Arg Leu Arg Thr Ile Leu Leu Lys Asp Val Glu Arg His
145 150 155 160

Thr Leu Phe Val Leu Asp Ser Trp Gln Gln Asn Ser Ile Phe Ser Ala
165 170 175

Gln Asp Glu Ala Lys Lys Phe Thr Phe Asn Leu Met Ala Lys His Ile
180 185 190

Met Ser Met Asp Pro Gly Glu Glu Glu Thr Glu Gln Leu Lys Lys Glu
195 200 205

Tyr Val Thr Phe Met Lys Gly Val Val Ser Ala Pro Leu Asn Leu Pro
210 215 220

Gly Thr Ala Tyr His Lys Ala Leu Gln Ser Arg Ala Thr Ile Leu Lys
225 230 235 240

Phe Ile Glu Arg Lys Met Glu Glu Arg Lys Leu Asp Ile Lys Glu Glu
245 250 255

Asp Gln Glu Glu Glu Glu Val Lys Thr Glu Asp Glu Ala Glu Met Ser
260 265 270

Lys Ser Asp His Val Arg Lys Gln Arg Thr Asp Asp Asp Leu Leu Gly
275 280 285

Trp Val Leu Lys His Ser Asn Leu Ser Thr Glu Gln Ile Leu Asp Leu
290 295 300

Ile Leu Ser Leu Leu Phe Ala Gly His Glu Thr Ser Ser Val Ala Ile
305 310 315 320

Ala Leu Ala Ile Phe Phe Leu Gln Ala Cys Pro Lys Ala Val Glu Glu
325 330 335

Leu Arg Glu Glu His Leu Glu Ile Ala Arg Ala Lys Lys Glu Leu Gly
340 345 350

Glu Ser Glu Leu Asn Trp Asp Asp Tyr Lys Lys Met Asp Phe Thr Gln
355 360 365

Cys Val Ile Asn Glu Thr Leu Arg Leu Gly Asn Val Val Arg Phe Leu
370 375 380

His Arg Lys Ala Leu Lys Asp Val Arg Tyr Lys Gly Tyr Asp Ile Pro
385 390 395 400

Ser Gly Trp Lys Val Leu Pro Val Ile Ser Ala Val His Leu Asp Asn
405 410 415

Ser Arg Tyr Asp Gln Pro Asn Leu Phe Asn Pro Trp Arg Trp Gln Gln
420 425 430

Gln Asn Asn Gly Ala Ser Ser Ser Gly Ser Gly Ser Phe Ser Thr Trp
435 440 445

Gly Asn Asn Tyr Met Pro Phe Gly Gly Gly Pro Arg Leu Cys Ala Gly
450 455 460

Ser Glu Leu Ala Lys Leu Glu Met Ala Val Phe Ile His His Leu Val
465 470 475 480

Leu Lys Phe Asn Trp Glu Leu Ala Glu Asp Asp Gln Pro Phe Ala Phe
485 490 495

Pro Phe Val Asp Phe Pro Asn Gly Leu Pro Ile Arg Val Ser Arg Ile
500 505 510

Leu

<210> 3

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer D4OVERF

<400> 3

atgttcgaaa cagagcatca tact

24

<210> 4

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer D4PRM

<400> 4

cctcgatcaa agagagagag a

21

<210> 5

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer D4RTF

<400> 5

ttcttggtga aaccatcggg tatcttaaa

29

<210> 6

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer D4RTR

<400> 6

tatgataagc agttcctggg agattt

26

<210> 7

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer D4F1

<400> 7

cgaggcaaca aaagtaatga a

21

<210> 8

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer D4R1

<400> 8

gtagaaact ctaaagattc a

21

<210> 9

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer D4F2

<400> 9
gattcttggc aacaaaactc tat

23

<210> 10
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer D4R2

<400> 10
ccgaacatct ttgagtgcctt

20

<210> 11
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer D4F3

<400> 11
gtgtgaaggt tataaatgaa actctt

26

<210> 12
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer D4R3

<400> 12
ggtttaatag tgtcgacact aata

24

<210> 13
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer D4F4

<400> 13
ccgatgactt gtacgtgcgt ta

22

<210> 14
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer D4F5

<400> 14
gcgaagcata taatgagtat ggat

24

<210> 15
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer D4R5

<400> 15
gttggtcata acgagaatta tccaaa

26

<210> 16
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer D4XLINIT

<400> 16
taggatccag ctagtttctc tctctctct

29

<210> 17
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer T7

<400> 17
taatacgact cactataggg

20

<210> 18
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer
D4OVERFA

<400> 18
gaattctaga atgttcgaaa cagagcatca ta

32